



Program Update to U-2 SIWG #10



U.S. AIR FORCE

29 Jul 2004

ASARS-2A Image Quality Improvement Program

**Maj. Bob Dietrick
ASARS Dev PM**

**Mr. Mike
Levanduski
ASARS Sust PM**



ASARS-2A

Image Quality Improvement Program (IQIP)



- **ASARS Team Structure**
- **ASARS-2A IQIP**
- **ASARS-2A Interfaces**
- **IQIP Phase 2 Issues**



ASARS IPT



Program Mgt/Engineering Financial Management

Maj Bob Dietrick

ASC/RAJI

Kelly Moore

ASC/RAFP

Mike Levanduski

WR/LXAS

Dawn Miller

ASC/RAFP

Carol Kennedy

WR/LXPF

Robin Napier

ASC/RAJI

Joe Heinig

ASC/RAJI

Lt Johnathan Artis

WR/LXAS

MSgt Rocky Walters

WR/LXGG

Steve Heaps

ASC/RAJI

Galen Strub

ASC/RAJI

Contracti

Wanda Verrett

WR/LXKA

Mary Zellmer

ASC/RAKP

Angela Lefas-Huhn

ASC/RAKP

Raytheon El Segundo

Item Management

Alice McRae
WR/LXAS

John Tsao

U-2/ASARS PM

Tony Jordan

Air Sys Lead

Tom Kim

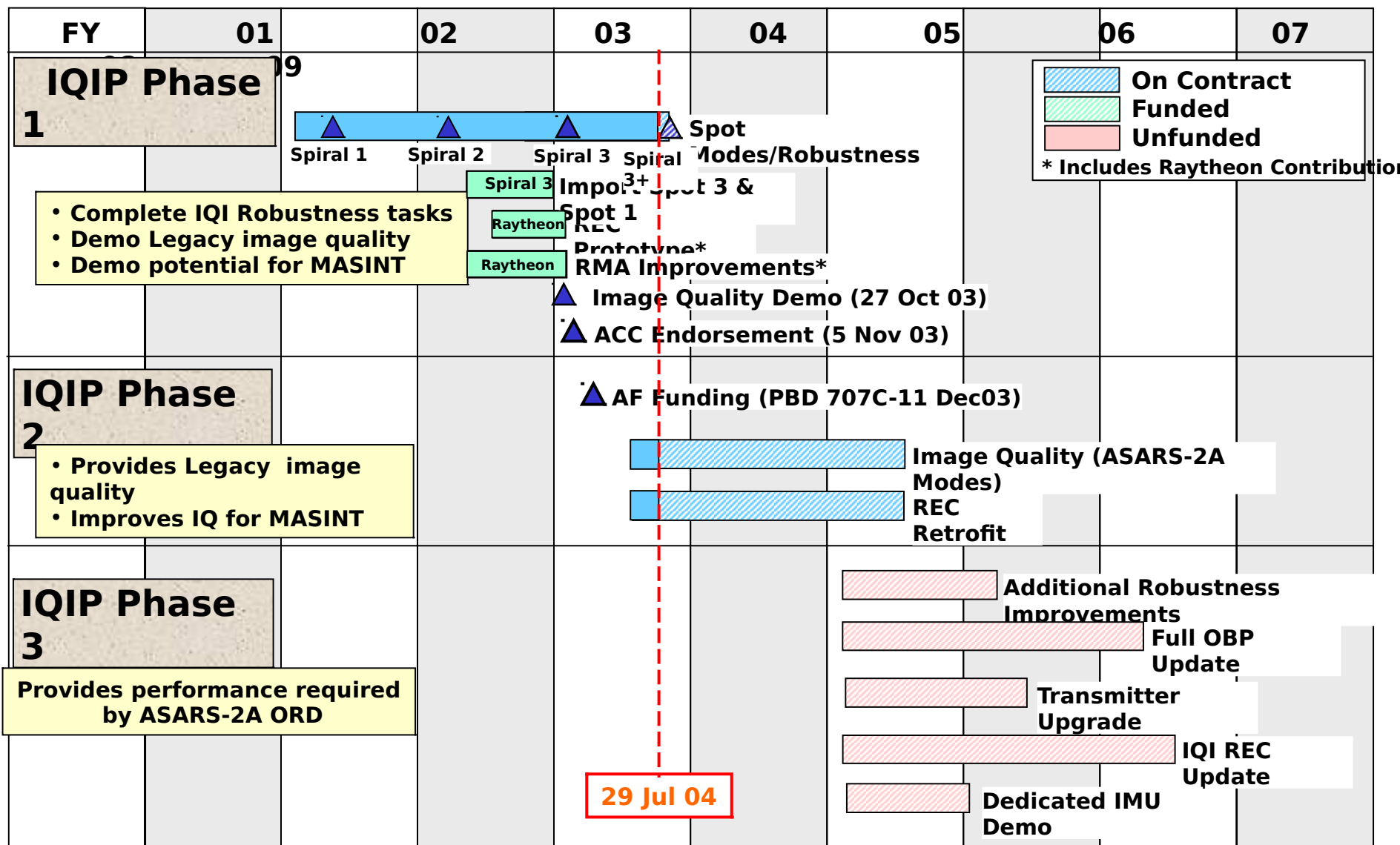
Gnd Sys Lead



U.S. AIR FORCE

ASARS-2A

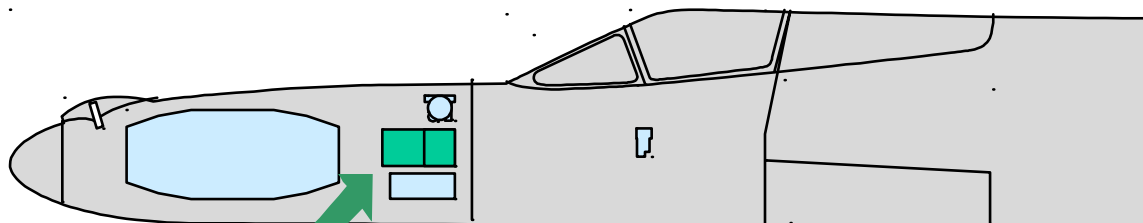
Image Quality Improvement Program (IQIP)



ASARS-2A IQIP Phase 2



Hardware Changes



REC

Fit/Form/Function Replacement

- Direct Digital Synthesizer
- Stable Oscillator
- Up Converter



U.S. AIR FORCE

ASARS-2A IQIP Phase 2



Airborne Software Baselines

IQIP Ph1
Spiral 3

ARS 2.0

- Final Robustness
- Rehosted Spot Modes

Spot Modes - Legacy image quality

IQIP Ph1 Spiral 3 PI

ARS 2.5

- Final Robustness
- Rehosted Spot Modes
- DDL Interface

Realigns DDL & ASARS baselines for Phase 2

IQIP Ph2 Interim Release

ARS 3.0

- Final Robustness
- Rehosted Spot Modes
- DDL Interface
- PI Mode Autofocus

Addresses major azimuth smearing issue

IQIP Ph2 Final Release

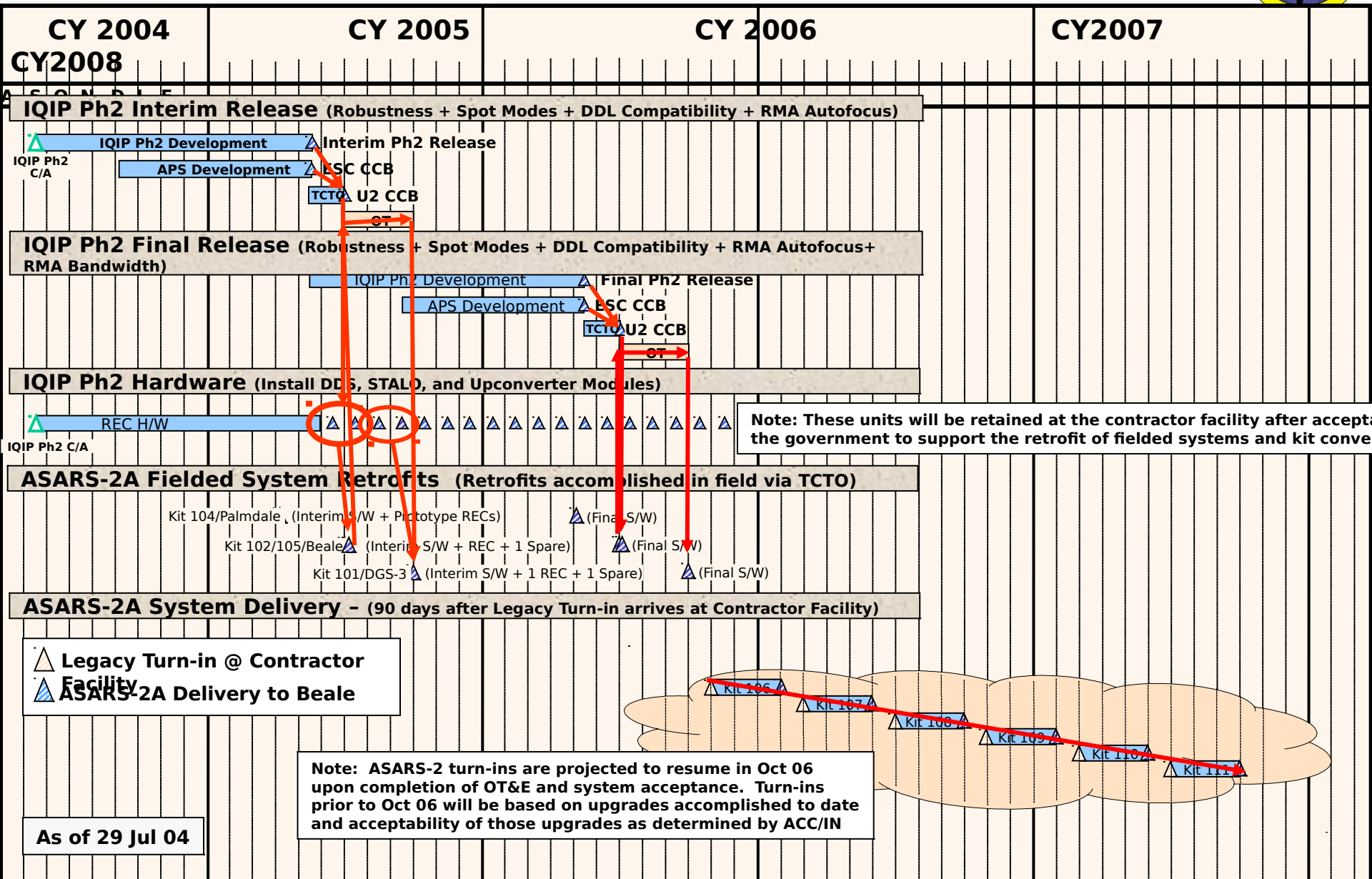
ARS 4.0

- Final Robustness
- Rehosted Spot Modes
- DDL Interface
- PI Mode Autofocus
- PI Mode Full Bandwidth

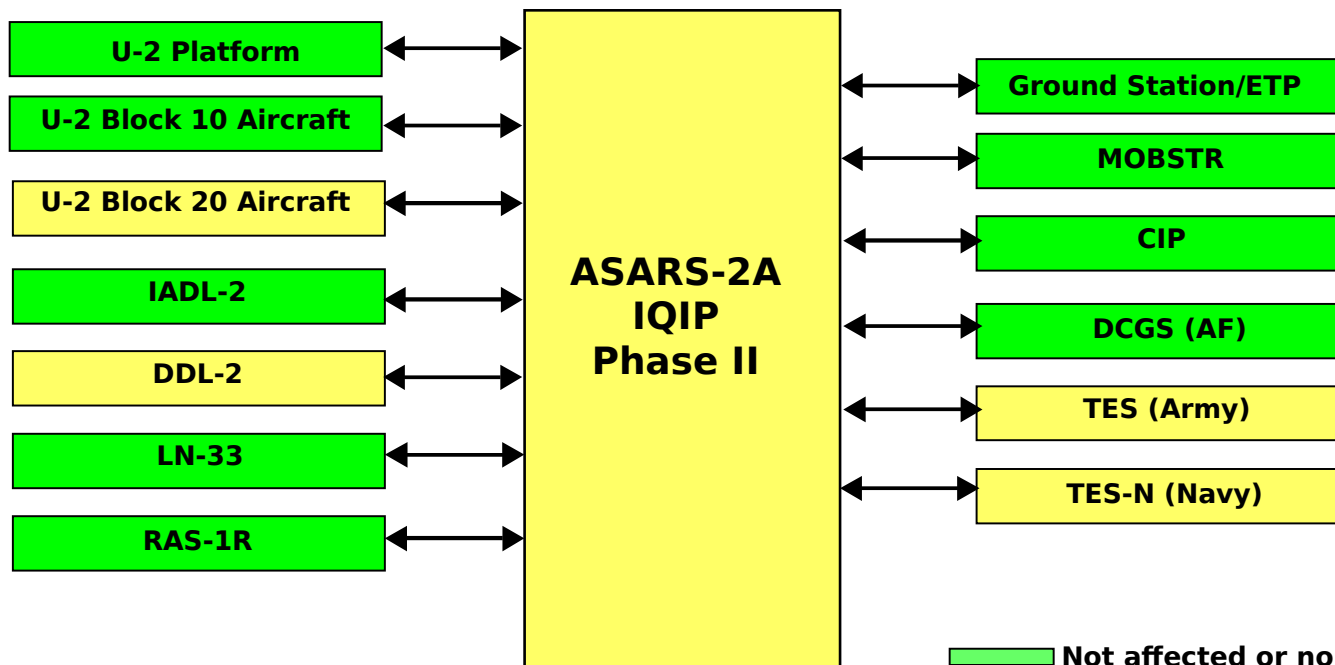
Provides best possible range resolution



ASARS-2A Delivery Options



ASARS-2A IQIP Interfaces



- Not affected or no problems
- Interface affected but requiring work
- Solution not coordinated/accomplished

ASARS-2A IQIP Interfaces



ICDs

- Phase II contains no new modes (modifies PI Mode)
- A/G ICD (ICD40042-166) will contain all changes



Requirements Allocations

- No SQWAP, Bandwidth, Power changes anticipated



Platform Compatibility

- Block 10 - No issues
- Block 20 - Watch Item
 - 1553 Bus changes may affect sensor



Datalink Compatibility (ARS 2.5 Baseline)

- IADL-2 - Regression testing complete (14 Jul 04)
- DDL-2 - End-to-end demo scheduled 30 Jul 04

ASARS-2A IQIP Interfaces



Maintenance/Operational Changes

- No change in levels of maintenance or maintenance concept
- Tech Data for modified REC included in Phase II contracts
- Updated training material included in Phase II contracts
- No change to any cockpit function



• Inter Agency/Service Interoperability

- CIP updates for processing capability – Complete
- Enhanced PI Mode (Full Bandwidth) - Final Release
 - Currently anticipate minor mode number changes only
 - Image formation and handling unaffected
 - Sensor control and exploitation management functions may require individual service action

IQIP Phase 2 Challenges



- **Autofocus Development**

- Autofocus algorithms and strategy developed in IQIP Phase 1
- Oct 03 RMA Demo - Demonstrated performance potential

- **Processor Capacity - Primary Technical Challenge**

- Risk mitigation tasks completed in Spiral 3+ contract
 - Processor loading analysis and software strategy

- **Flight Test - Primary Program Challenge**

- IQIP Ph 2 incentive strategy focused on IQ performance and cost
 - Availability of government furnished flight test, when needed, is critical to contract incentive strategy
 - Working to ID and address flight test requirements up front



U.S. AIR FORCE

IQIP Phase2 Flight Test Requirements



ID	Task Name	Start	Finish	2004												2005												2006													
				M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J											
1	IQIP PHASE 2 (RP2)	Tue 7/6/04	Mon 5/29/06																																						
2	RP2 - STAGE ONE Flight Test	Tue 7/6/04	Thu 11/25/04																																						
3	Flight #1 DC1	Tue 7/6/04	Mon 7/12/04	7/6	7/12	Complete 14 Jul 04																																			
4	Flight #2 DC2	Mon 8/23/04	Fri 8/27/04	8/23	8/27																																				
5	Flight #3 B1	Fri 10/15/04	Thu 10/21/04	10/15	10/21																																				
6	Flight #4 B2	Fri 11/5/04	Thu 11/11/04	11/5	11/11																																				
7	Flight #5 B3	Fri 11/19/04	Thu 11/25/04	11/19	11/25																																				
8	RP2 - STAGE TWO Flight Test	Tue 2/8/05	Fri 6/3/05																																						
9	Flight #6 DC3	Tue 2/8/05	Mon 2/14/05	2/8	2/14																																				
10	Flight #7 DC4	Tue 3/1/05	Mon 3/7/05	3/1	3/7																																				
11	Flight #8 B4	Tue 4/26/05	Mon 5/2/05	4/26	5/2																																				
12	Flight #9 B5	Tue 5/10/05	Mon 5/16/05	5/10	5/16																																				
13	Flight #10 B6	Mon 5/30/05	Fri 6/3/05	5/30	6/3																																				
14	RP2 - STAGE THREE Flight Test	Wed 8/3/05	Thu 11/24/05																																						
15	Flight #11 DC5	Wed 8/3/05	Tue 8/9/05	8/3	8/9																																				
16	Flight #12 DC6	Wed 8/24/05	Tue 8/30/05	8/24	8/30																																				
17	Flight #13 B7	Tue 10/18/05	Mon 10/24/05	10/18	10/24																																				
18	Flight #14 B8	Tue 11/1/05	Mon 11/7/05	11/1	11/7																																				
19	Flight #15 B9	Fri 11/18/05	Thu 11/24/05	11/18	11/24																																				
20	RP2 - STAGE FOUR Flight Test	Wed 1/11/06	Mon 5/29/06																																						
21	Flight #16 DC7	Wed 1/11/06	Tue 1/17/06	1/11	1/17																																				
22	Flight #17 DC8	Wed 2/1/06	Tue 2/7/06	2/1	2/7																																				
23	Flight #18 B10	Wed 3/29/06	Tue 4/4/06	3/29	4/4																																				
24	Flight #19 B11	Wed 4/12/06	Tue 4/18/06	4/12	4/18																																				
25	Flight #20 B12	Wed 5/3/06	Tue 5/9/06	5/3	5/9																																				
26	Flight #21 A1	Wed 5/17/06	Tue 5/23/06	5/17	5/23																																				
27	Flight #22 A2	Tue 5/23/06	Mon 5/29/06	5/23	5/29																																				

DC - Data collection flight
B - Baseline development flights
A - Acceptance flights

Summary



• **ASARS-2A Image Quality Improvement Program (IQIP)**

- Designed to address ASARS-2A performance issues
- **IQIP Phase 1 - Focus on Robustness & Detected IQ**
 - Spiral 3 improved system robustness
 - Imported Spot Modes addressed detected IQ requirements
 - Demonstrated performance potential for PI Mode
- **IQIP Phase 2 - Focus on PI Mode IQ for MASINT**
 - Funding in place
 - Contracts awarded May 04
 - Flight test execution critical to program success

